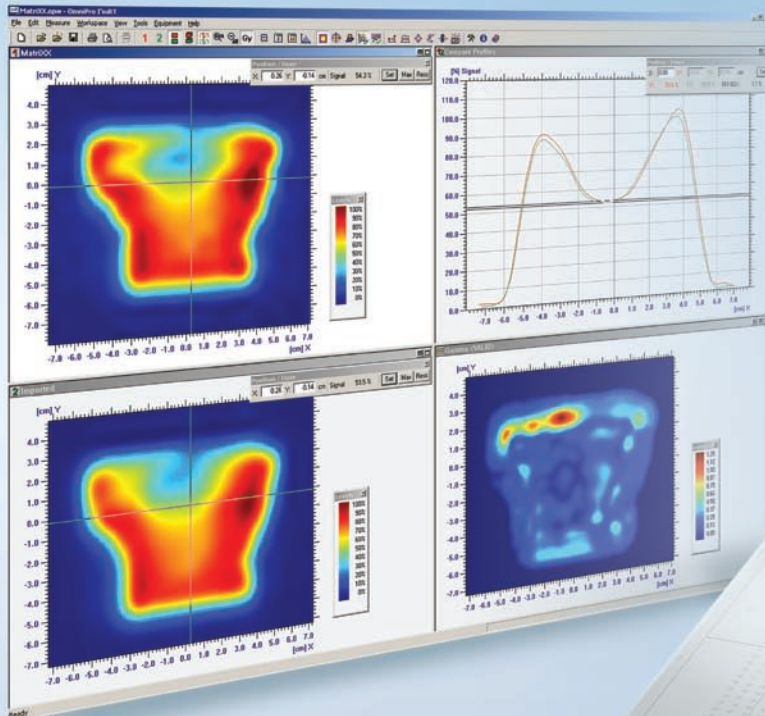# I´m*RT* MatriXX

The new standard in 2D IMRT pre-treatment verification

The 2D solution for digital IMRT verification

- ➤ **Verification of absorbed dose vs plan**
- ➤ **Provides an ionization chamber reference standard for films analyzed with the integrated film QA software**
- ➤ **No dead time during the data acquisition due to unique electrometer solution**
- ➤ **Automatic k(t,p) correction**

- ➤ **No need for frequent recalibration**
- ➤ **IMRT verification of individual (segment) as well as integrated (composite) fields**
- ➤ **Fully integrated in OmniPro-I´m*RT* software platform**

- ➤ **Small volume, high accuracy Pixel Ionization Chamber Technology (PIC)**
- ➤ **Long-term radiation resistance of ionization chambers**
- ➤ **Proven clinical results by cooperation partner Torino University and INFN (Italy)**

FASTest
mostACCURATE
mostRELIABLE

Due to the unique Pixel Ionization Chamber Technology (PIC) the I´m*RT* MatriXX is the most advanced solution for fast, accurate and reliable digital IMRT verification. The PIC technology combines the advantages of vented ionization chambers using PCB technology with a state-of-the-art ASICs based electrometer. The I´m*RT* MatriXX was designed and built in cooperation with Torino University and INFN, who brought in their experience in leading edge high energy physics.

The I'm*RT* MatriXX verifies individual (segment) as well as integrated (composite) IMRT fields without dead time during the data acquisition. Due to the unique electrometer solution based on ASICs technology, all 1020 vented pixel ionization chambers are read out in parallel with a minimum sampling time of only 20 ms per 2D field.

As a result the Pixel Ionization Chamber Technology (PIC) used in the I´m*RT* MatriXX significantly reduces the time spent in dosimetric verification of complex IMRT radiation fields.

Make your daily clinical workflow as efficient as possible

OmniPro-I´m*RT* enables fast verification of measured versus planned IMRT treatment cycles. It incorporates 1D profiles, 2D isodose profiles as well as fully automated modern analysis tools such as the Gamma Method.

The I´m*RT* MatriXX acquires both individual IMRT segments as well as integrated fields from either static (step and shoot technique) or dynamic (sliding window technique) IMRT treatments. Subsequent verification down to individual segment level enables fast and efficient error finding and correction in case of an inconsistency between measured and planned data.

Measured and treatment planning data can be automatically analyzed based on basic (e.g. sum, difference) as well as advanced maths (e.g. Gamma Method, DTA). For the data display the OmniPro-I´m*RT* software offers advanced tools such as histograms and 3D dose distributions.

Different QA protocols enable online analysis of penumbra, symmetry, flatness and field size. Critical Linac QA parameters can be monitored and adjusted real-time in inplane and crossplane dimensions.

The data is transferred via Ethernet and TCP/IP protocol. Remote access through a convenient integration into your clinical network enables you to analyze the data online or at a later time.

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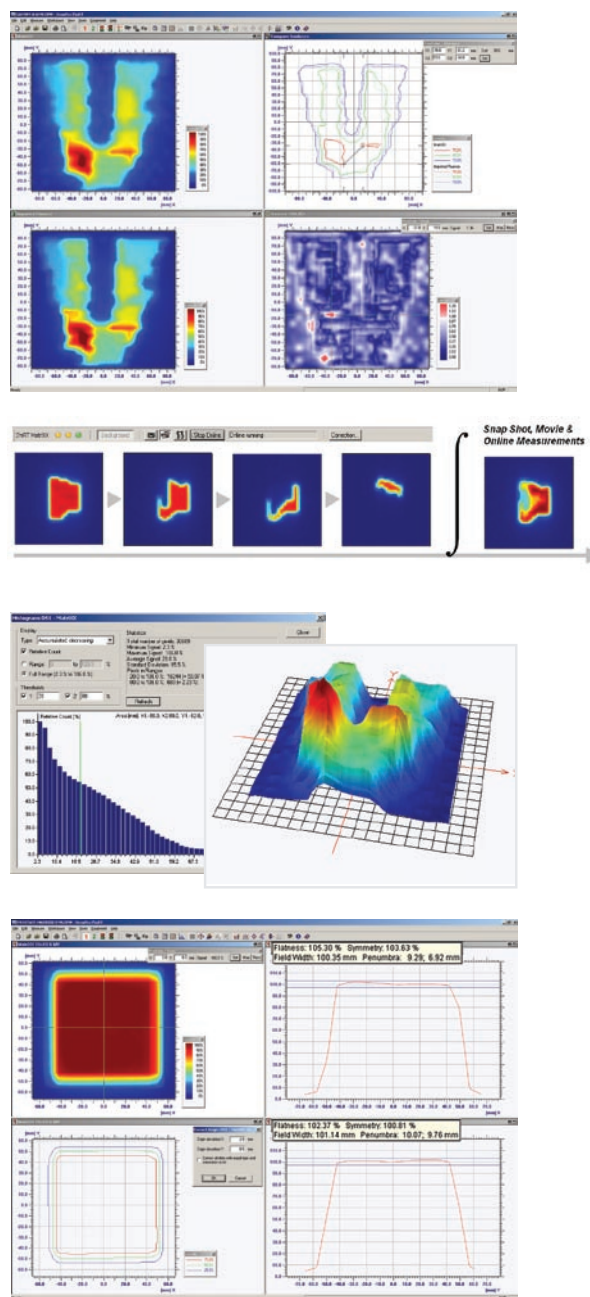
Technical specifications

I'm*RT* MatriXX

Application:	Machine QA, static and dynamic measurements of MU´s, dose distributions and leaf positions; IMRT patient-specific plan verification
Measuring quantity:	absorbed dose, dose rate
Intrinsic build-up:	3.3 mm water equivalent depth
Backscatter material:	RW3 (composition; 98% Polystyrol + 2% TiO_2, and density: 1.045 g/cm³); thickness 22 mm
Dose rate range:	0.02 – 20 Gy/min
Resolution (dose and dose rate):	0.5 mGy resp. 0.5 mGy/min
Resolution (mm):	7.62 mm, interpolated down to 1 mm
Dead time:	zero
k(t,p) correction:	temperature (10-40 °C), pressure (70-110 kPa)
Dimensions:	56 cm (L) x 6 cm (H) x 32 cm (W)
Weight:	≈10 kg
Power supply:	100-240 V, 50/60 Hz, power cord with US or German power plug included

Sensor

Number of chambers:	1020
Active area:	24.4 x 24.4 cm²
Sensor layout:	matrix in a plane arranged in a 32 x 32 grid
Pixel distance:	7.62 mm center-to-center
Chamber type:	vented pixel ionization chambers
Chamber size:	4.5 (Ø) x 5 (h) mm, chamber volume 0.08 cm³
Typical sensitivity:	0.42 Gy/nC
Effective point of measurement:	3 mm from surface

Electrometer

Electrometer:	16 TERA ASICs (each contains 64 independent electrometers)
Channels:	1020
Charge resolution:	0.1 pC/count
Sampling time:	min. 20 ms
Readout:	parallel with no dead time

Minimum computer requirements

Operating system:	Microsoft® Windows® (XP, VISTA™* 32-bit)
Processor:	Pentium® (or equivalent), 1.8 GHz or better
Memory:	2 GB RAM (recommended for real-time intensity mode)
Hard disk:	with at least 160 MB available, recommended 40 GB for data archiving
Monitor and graphics:	supporting a resolution of 1024 x 768 pixel at True Colour (32-bit)
Ports:	available Ethernet connection (RJ-45 for I'm*RT* MatriXX) interface to film scanner, USB 2.0

Technical data is subject to change without prior notice.
* Some accessories might not be Microsoft® Windows® Vista™ compatible (e.g. Film scanner)

Manufacturer:

Germany
IBA Dosimetry GmbH
Bahnhofstr. 5
90592 Schwarzenbruck
Tel.: +49 9128 607 0
Fax: +49 9128 607 10

USA
IBA Dosimetry America
3150 Stage Post Drive, Suite 110
Bartlett, TN 38133
Tel.: +1 901 386 2242
Fax: +1 901 382 9453

Sweden
IBA Dosimetry AB
P.O. Box 1004
751 40 Uppsala
Tel.: +46 18 18 07 00
Fax: +46 18 12 75 52

China
IBA Dosimetry China
No.6, Xing Guang Er Jie Beijing
OPTO-mechatronics
Industrial Park (OIP),
Tongzhou District
Beijing 101111
Tel.: +86 10 8080 9288
Fax: +86 10 8080 9299

CE

www.iba-dosimetry.com
info@iba-dosimetry.com

iba